REMARKS

This application has been amended. Specifically, claims 13 and 20 have been amended to define the back-flush flow rate. Additionally, claims 23 and 24 have been added. Support for these amendments can be found, for example, in lines 11-14 of page 3 of the application as filed as well as in the originally-filed claim set. Thus, no new matter has been added. Claim 14 has been cancelled. In view of the foregoing amendments and following remarks, reconsideration of the outstanding rejections and allowance of claims 13, 15-18 and 20-24 are respectfully requested.

The claims of the present application are directed to a process for cleaning a filter contaminated with water-insoluble residues formed on the membrane during the beverage filtering process. As described in the application, research has revealed that during the membrane separation process for cleaning certain beverages, such as beer, the fouling of the membrane begins when a complex of polyphenols and proteins forms on the membrane. The fouling continues when other components, such as polysaccharides or yeasts, adsorb onto the polyphenol protein complexes already formed on the membrane surface. This ultimately results in the membrane pores becoming blocked, detrimentally affecting the filtration process.

Applicants' inventive cleaning process allows membranes fouled in the above manner to be cleaned effectively without severely limiting the life cycle of the membrane, which is a downfall of other chemical-based cleaning methods. Applicants achieve these goals by targeting the polyphenol protein complexes formed on the membrane surface, without also focusing on the polysaccharides and other hydrophilic residues that may be formed on the polyphenol protein complexes. Because the polyphenol protein complexes are formed first on the membrane, they can be attacked by back-washing the membrane with a cleaning solution. Moreover, since the cleaning solution targets the polyphenol protein complexes, rather than the polysaccharides, the composition of the cleaning solution can be better tailored. Furthermore, the total amount of oxidizing agent used in the cleaning process can be limited, thereby lowering the harm caused to the membrane during cleaning.

Applicants submit that the combination of references cited in the Office Action does not render the claimed methods obvious. While Jennings discusses the use of a back-

washing technique to treat membranes, this reference implies that such conventional techniques are inadequate in that Jennings is primarily directed to an alleged improvement of the back-flow and other fluid flow cleaning schemes. Moreover, to the extent Jennings discusses the back-washing technique, the sanitizing solution used therewith comprises a mild hypochlorous acid or iodine-phosphoric acid complex or other cleaning solution used in the dairy industry to remove molds and various bacteriological growths. No further detail on the cleaning solution, the types of bacteriological growths to be targeted, or the back-wash conditions are provided.

Even upon consideration of the secondary references (Schuchardt and Fremont for claim 13 and Fremont alone for claim 20), one skilled in the art would still not consider Applicants' invention obvious. Schuchardt is not directed to treating membranes at all, but is instead directed to effectively neutralizing a waste water stream by adding thereto an oxidizing agent and optionally a transition metal catalyst. Fremont, which provides examples in which a membrane fouled with humic acid is immersed in a peroxide solution and then rinsed with an alkali metal solution, appears to only be cited as suggesting that membranes can be made of polymer. The Office Action contends it would be obvious to use a transition metal catalyst in the "conventional" back-washing process of Jennings to degrade higher molecular weight polyols based on Schuchardt. However, as mentioned above, Schuchardt is not directed to treating membranes. Moreover, since neither Jennings nor Schuchardt is directed to treating membranes used in the beverage industry, there is no motivation to combine these references to create a method of targeting polyphenol protein complexes such as those formed on a membrane during the beverage separation filtering process.

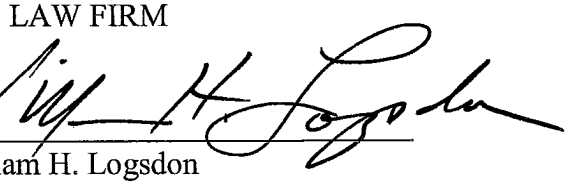
In addition, the Office Action fails to explain where in the prior art the particular back-flush rate now defined in claims 13 and 20 is disclosed. The statement that it would be obvious to manipulate the flow rate is not supported by any evidence. This deficiency is especially significant since certain of the references, such as Schuchardt, are not directed to back-flushing at all but instead discuss treating wastewater streams by adding chemicals thereto. Similarly, Applicants submit that newly added claims 23 and 24, further defining the back-washing flow process, are also patentable.

CONCLUSION

For the foregoing reasons, Applicants submit that the pending claims are patentable over the cited references and are in condition for allowance. Accordingly, reconsideration of the outstanding rejections and allowance of pending claims 13, 15-18 and 20-24 are respectfully requested.

Respectfully submitted,

THE WEBB LAW FIRM

By 

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